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I, MARIO PERUSSICH, ASSISTANT DIRECTOR PATENT SERVICES, hereby certify that the annexed are true copies of the Provisional specification and drawing(s) as filed on 9 December 1996 in connection with Application No. PO 4055 for a patent by PAUL DAMIAN NELSON.

I further certify that the annexed documents are not, as yet, open to public inspection.

PRIORITY DOCUMENT

WITNESS my hand this Tenth
day of December 1997

MARIO PERUSSICH
ASSISTANT DIRECTOR PATENT SERVICES

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION

Applicant(s):

Paul Damian NELSON

Invention Title:

APPARATUS

The invention is described in the following statement:

APPARATUS

This invention relates to a seat and, in particular, but not exclusively, to bicycle seats. The present invention is an improvement or modification to the seat as disclosed in my international application PCT/AU96/00273 and my international application PCT/AU94/00284. The contents of these earlier international applications are incorporated into this specification by this reference.

In a first aspect, the invention may be said to reside in a support system including:

an inflatable housing which defines a chamber for receiving a fluid; and

wherein when a user is supported by the support system and moves, fluid is caused to move from one part of the housing to another part of the housing so that the said one part can change its shape and/or form and the fluid flow to said another part causes the said another part to change its shape and/or form in response to the change in fluid in said another part of the housing.

Thus, with the support system according to this aspect of the invention, when a user is supported by the support system and the user moves, fluid is caused to move from one part to another part to change the shape of the support system to facilitate support. In one embodiment the support system is a bicycle seat. In the case of a bicycle seat, as a user is pedalling, movement of the legs and buttocks during pedalling can place an increase in pressure on one part of the seat so that fluid is forced from that part to another part which has less pressure on it so that that part can expand so as to maintain some contact and support of the user notwithstanding the reduction in pressure applied by the user during riding. The fluid can basically move back and forward as the rider pedals to

result in one part of the seat collapsing and then reinflating as the fluid moves back and forward during pedaling so that various parts of the seat collapse under the weight of the user or expand to maintain contact of the seat with the user and mimic movement of the user as the user pedals the bicycle.

Preferably the housing includes a fluid inlet in the housing for enabling fluid to enter the housing.

Preferably the housing includes rigid sections so that the general shape of the housing is maintained notwithstanding the fact that the housing is able to expand or collapse during movement of the user on the seat.

The housing may be a single chamber which changes form. However, preferably the housing includes two housing portions joined by a fluid passage so that when fluid passes from one part of the housing to the another part of the housing, the fluid passes through the fluid passage to thereby direct the fluid to particular parts of the housing for expansion of those parts of the housing. By selecting the position of the fluid passage, various parts of the housing can be made to expand more or less than others depending on the particular use of the seat or needs of a particular user.

Preferably the housing is made from elastomeric material such as rubber, elasticated plastic or like stretchable material to enable expansion and contraction of the housing as the fluid moves from one part of the housing to another part of the housing.

Preferably the seat has a base plate for supporting the housing.

Preferably the base plate has attachment means for attaching the seat to an article.

Preferably the attachment means comprises a pair of rails.

Preferably the seat is a bicycle seat but in other embodiments, the seat could be a lounge chair or like seat, or a medical application appliance such as a therapeutic or rehabilitation or harness like appliance.

A second aspect of the invention may be said to reside in a support system including:

a first portion;

a second portion;

the first and second portions being coupled to one another by spring material so that the first portion can move in response to a user's weight and/or pressure applied by a user when a user is supported by the support system and return as a user moves and reduces pressure and/or weight on that portion of the support system.

Thus, in this aspect of the invention, the support system is also able to generally follow the movement of the user's anatomy as the user moves on the support system.

Preferably the first portion of the support system includes two separate sections.

Preferably the first portion of the support system and the second portion of the support system are formed from spring material and the hinge is an integral part of the support system forming a transition between the first and second portions.

In another embodiment of the support system, the first and second portions may be formed from non-spring material and

be coupled together by a hinge section formed from spring material.

A further aspect of the invention may be said to reside in a support system, including:

an abutment portion within the support system;

biasing means for biasing the abutment portion relative to the support system so that the abutment portion can move relative to the support system; and

the biasing means providing a floating support for the abutment portions so that the abutment portion can move relative to the support system against the bias of the biasing means in response to the weight or pressure of a user when supported by the support system.

The biasing means may comprise a pad or block of resilient material, a spring, or air, for biasing the abutment portion relative to the support system.

In one embodiment, the support system is a seat and includes a cover member for covering the seat surface portion and the abutment portion.

In one embodiment of the invention, the seat includes a single abutment portion which may be in the pubic area. However, in other embodiments, two or more abutment portions could be used. Furthermore, the abutment portion or abutment portions may be arranged at different positions on the seat to provide different support characteristics depending on the position at which the abutment portion is located.

In one embodiment of the invention, the abutment portions are disc-shaped and in the embodiment where the biasing means comprises air, the abutment members may be hollow members formed from elastic material to enable expansion of

the abutment members so as to move the abutment portion relative to the seat surface portion, or alternatively the biasing means may be an inflatable chamber below the abutment portion.

The biasing means may also be in the form of an air spring.

In other embodiments, the abutment portions may be ramp-shaped so as to form an inclined abutment portion.

According to a fourth aspect of the invention there is provided a support system, including:

at least two separate chambers in the support system; and

a fluid inlet to each of the chambers for allowing fluid to enter each of the chambers.

This aspect of the invention enables the at least two chambers to be inflated by fluid to different degrees to provide different support characteristics at the location of the two chambers.

A fifth aspect of the present invention may be said to reside in a support system including:

an inflatable abutment portion coupled to the support system;

a fluid inlet to the inflatable abutment portion for coupling with a fluid reservoir for retaining a supply of fluid; and

fluid control means for allowing flow of fluid from the fluid reservoir to the inflatable abutment portion.

This aspect of the invention enables an inflatable abutment portion to be inflated to provide an abutment for high performance racing or the like or to merely change the

setting surface characteristics of the support system to suit a user. The fluid control means enables a certain amount of fluid to be supplied to the inflatable abutment portion to either fully inflate the abutment portion so that the abutment portion effectively forms a generally rigid abutment portion or to partially inflate the abutment portion so that the abutment portion is able to move under the weight and/or pressure of a user and to follow the change in contour of a user's anatomy as a user moves on the support system.

Preferably the fluid reservoir is coupled to the control means.

In the preferred embodiments of the invention, the fluid which is supplied to the housing or which is used to inflate the abutment portion(s) comprises air but in some embodiments of the invention if it is desired to minimise weight, a lighter gas such as helium could be utilised.

Once again, in the preferred embodiment, the support system is a bicycle seat.

In other embodiments, the gas may be some other gas applicable to particular types of fluid reservoirs such as carbon dioxide cartridges or the like, nitrogen or the reservoir may be a chamber manually inflated with air by a pump or the like.

A sixth aspect of the invention provides a support system including:

a support portion; and

at least one abutment portion in the support portion, the abutment portion being a fluid chamber for containing a fluid.

Preferably the fluid chamber includes a fluid inlet and the fluid chamber is an inflatable chamber.

A seventh aspect of the invention provides a support system including:

an abutment portion coupled to the support system;

fluid receiving means for moving the abutment portion relative to the support system; and

fluid control means for controlling the application of fluid to the fluid receiving means to provide a desired amount of movement of the abutment portion and/or lock of the abutment portion in a desired position relative to the support portion.

Preferred embodiments of the invention will be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a view of a bicycle seat according to a first embodiment of the invention;

Figure 2 is a view of the seat of Figure 1 taking up a different configuration;

Figure 3 is a view of a further embodiment of the invention;

Figure 4 shows a further embodiment of the invention;

Figure 5 is a view of a still further embodiment of the invention;

Figure 6 is a side view of the embodiment of Figure 5;

Figure 7 is a plan view of the embodiment of Figure 5 in a different configuration;

Figure 8 is a side perspective view of the embodiments of Figure 5;

Figure 9 is a plan view of a bicycle seat according to a further embodiment of the invention;

Figure 10 is a plan view of yet a further embodiment;

Figure 11 is a view of a further embodiment of the invention;

Figure 12 is a side view of the embodiment of Figure 9;

Figure 13 is a side view according to a different embodiment;

Figure 14 is a detailed view of part of the embodiment of Figure 9;

Figures 15 to 17 show alternative structures to the arrangement shown in Figure 14;

Figure 18 shows a modification to the embodiment of Figure 17;

Figure 19 shows a further alternative to the arrangement shown in Figure 18;

Figure 20 shows the arrangement of Figure 19 in a fully inflated condition;

Figure 21 shows yet a further embodiment of the invention;

Figure 22 shows yet a further embodiment of the invention;

Figure 23 shows a still further embodiment of the invention;

Figures 24 to 34 show various modifications in the embodiment of Figure 23 applicable to bicycle seats;

Figure 35 shows part of the embodiments of Figures 23 to 34;

Figure 36 is an alternative to the embodiment shown in Figure 35;

Figure 37 shows part of the embodiments of Figures 23 to 34;

Figure 38 is a view along the line A-A of Figure 27; and

Figure 39 shows a view of the arrangement of Figure 37 in a connected condition.

Figure 1 shows a bicycle seat 10 according to a first embodiment of the invention. The seat 10 has a base plate 12 to which is welded or otherwise secured a pair of rails 14 to enable the seat 10 to be secured to a bicycle in a manner which is well known. The base plate 12 supports an inflatable hollow housing 16. The housing 16 is preferably made from elastomeric material so that it can expand when inflated by the application of fluid to the interior of the housing 16. An inlet valve 18 is provided in the housing 16 for enabling fluid to be pumped into the housing 16 by a conventional bicycle pump or any other suitable source of pressurised fluid.

The housing 16 has two portions 16a and 16b which are joined by a bridging passage 20. The portions 16a and 16b receive a part of the buttocks of a rider and the bridging passage 20 enables fluid, preferably air, to move from one portion 16a to the other portion 16b through the passage 20 as the rider pedals and as more pressure is supplied to one of the sections 16a or 16b than the other of the sections 16a or 16b.

As is shown in Figure 2, the section 16b is shown slightly compressed and collapsed due to additional weight of a rider (not shown) applied to that portion during pedalling of a bicycle. Fluid in the portion 16b therefore passes through the passage 20 into the portion 16a and the portion 16a is inflated further by the fluid which passes from the portion 16a. Thus, as pressure is applied to the portion 16b, that portion can slightly collapse under the pressure of a rider and the portion 16a which may have reduced pressure applied to it during cycling motion is able to expand to maintain support of the rider during pedalling motion. Thus, as the rider pedals, the portion 16a and 16b in turn basically collapse and expand as fluid is pushed from one portion 16a to the other portion 16b and then back

from the portion 16b to the portion 16a during the pedalling motion so that the seat moves with the rider somewhat in seesaw fashion by virtue of the transfer of the fluid from the portion 16a to the portion 16b. This provides comfort to the rider because the seat is changing shape as the rider pedals and also provides support during the pedaling motion because the seat basically expands and collapses as pressure is applied and reduced to the seat during the pedalling motion.

Preferably the housing 16 is reinforced by reinforcing such as ribbing, a cell structure, a support frame or the like (not shown) so that when air is applied to the inlet valve 18 to inflate the housing 10, the housing 10 basically inflates to the shape shown in Figure 1. As fluid transfers between the portions 16a and 16b, the portions 16a and 16b inflate so that they increase in size relative to the position shown in Figure 1 (as is shown in Figure 2) but maintain the general shape of the portion shown in Figure 1. That is, the portions basically enlarge in size and maintain their shape during that enlargement rather than merely totally deforming to a spherical or like shape as pressure increases in the portions 16a and 16b.

Figure 3 shows an embodiment of the invention in which a seat 20 is in the form of a normal lounge seat or car seat etc rather than a bicycle seat and wherein the housing 10′ is located in the seat 20 and which operates as described with reference to Figure 1. In this embodiment, the shape of the housing 10′ may be different from that shown in Figure 1 but as a user shifts his or her position on the seat, fluid will transfer from one part of the housing 10′ to another part so that the housing expands and contracts during the movement generally in the same manner as described with reference to Figure 1.

Figure 4 shows a further embodiment in which the seat is of slightly different shape to that shown in Figure 1. In the embodiment of Figure 4, the seat 10" has a pelvic area 30 and two side portions 32 which form supports for the ischial region of a rider's anatomy. The pelvic region 30 basically forms the passageway for transfer of fluid between the portions 32 in exactly the same manner as described with reference to Figure 1.

Thus, in the embodiment of Figure 4, the passageway 30 is basically in a different position to the passageway 20 in Figure 1. By locating the passageway in different positions, the nature of the transfer of fluid from one portion of the housing 10 or 10' or 10" to another portion of the housing can change to slightly alter the inflation or expansion characteristics of the various portions of the housing during movement of a user on the seat.

Returning to Figure 1, for example, if the passageway 20 was located as shown by the dotted lines in Figure 1 and referenced by the numeral 20', more air may be applied to the front portion of the seat during fluid transfer to basically cause the front portion to inflate slightly greater than the rear portion of the seat which will change the shape characteristics slightly and therefore the nature of support during pedalling.

Figure 5 shows yet a further embodiment of the invention. In the embodiment of Figure 5, a seat 40 is shown which has a pair of buttock support sections 42 which are separated by a longitudinal slot 44. A horn section 44 joins the two buttock support sections 42 so that the seat is generally of the conventional shape of a bicycle seat except for the inclusion of the slot 44 between the buttock support sections 42. Hinge portions 46 are provided between the buttock support sections 42 and the horn section 44 and the

hinge sections 46 are made from spring material such as spring metal or spring plastics material or polymers. As is shown in Figure 6, the buttock support sections 42 are angled upwardly at an angle with respect to the horn section 44 so that when a rider seats on the seat, the buttock support sections 42 will pivot about the spring material hinge 46 under the weight and/or pressure supplied by the user.

The seat 40 may be formed from spring metal material or spring plastic material and in such an embodiment, the hinge sections 46 are merely integral portions of the seat 40 and defined by the transition areas between the buttock support sections 42 and the horn section 44. However, in other embodiments, the buttock support sections 42 and the horn section 44 may be formed from non-spring material such as aluminium plate or steel plate and the buttock support sections 42 may be connected to the horn section 44 by the hinge portions 46 which are formed from spring material such as spring steel or spring plastic material.

When a user seats on the bicycle seat of Figure 5, the buttock support sections 42 will tend to move downwardly as shown by arrow A in Figure 6 and also slightly towards the side as shown by arrow C in Figure 7. The separation of the buttock support sections 42 in Figure 7 is exaggerated to show the slight sideways movement of the portion 42 as the user seats on the seat. During pedalling motion, the portions 42 will therefore tend to move upwardly and downwardly as shown by arrows D and E in Figure 8 as the rider pedals and as pressure is applied to one of the portions 42 and then reduced and as pressure is applied to the other portion 42 so that the portions 42 basically move in paddle like or seesaw like movement during pedalling motion by the user.

Figure 9 shows a further embodiment of the invention in which a bicycle seat 50 is provided with an abutment portion 52 which is formed within remaining surface portion 54 of the seat 50. Thus, the abutment portion 52 and remaining surface portion 54 would normally make up the seat area on which a rider would seat during riding of a bicycle.

Figure 10 shows a similar embodiment to Figure 9 except there are two abutment portions 52 instead of one and Figure 11 shows yet a further embodiment in which the abutment portion 52 is in a slightly different position than in Figure 9.

As is best shown in Figure 12, the abutment portion 52 is preferably completely separate to the remainder 54 of the seat and is spring biased by a biasing member such as a spring 56 so that the abutment portion 52 can move relative to the remaining seat portion 54. The spring 56 is provided between a base section 58 of the seat 50 and the abutment portion 52. In the embodiment shown in Figure 12, the spring 56 normally biases the abutment member 52 upwardly out of the plane of the remainder of the seat portion 54 so that before a rider seats on the seat, the abutment portion 52 is up above the level of the remaining portion 54 of the seat 50. In the embodiment of Figure 13, the abutment portion 52 is biased by the spring 56 so that it is below the remaining portion 54 of the seat before a rider seats on the seat. In other embodiments the remaining portion 54 and abutment portion 52 may initially be level with the abutment portion 52 being biased so it moves relative to the portion 54 when a user seats on the seat.

When a rider seats on the seat of Figure 12, the abutment portion 52 is pushed downwardly against the bias of the

spring 56 and the abutment portion 52 is able to float by virtue of the spring bias supplied by the spring 56 during pedalling movement of a user to basically move up and downwardly relative to the remaining seat portion 54 as the rider pedals the bicycle to provide continually adjustable support as the rider moves during pedalling motion and as the pressure of the rider's anatomy changes during pedalling motion and also to provide comfort during the pedalling motion.

In the embodiment of Figure 13, the seat portion 54 will normally compress downwardly toward the base 58 as the rider seats on the seat and the abutment 52 will then be contacted by the user's anatomy. However, the abutment 52 in this embodiment moves under the bias of the spring 56 during the pedalling motion generally in the same manner as shown in Figure 12. However, because the abutment portion 52 commences at a level below the level of the remaining seat portion 54, the nature of support and movement is slightly different to provide slightly different support and comfort characteristics than the arrangement shown with reference to Figure 12.

Figure 14 shows one preferred embodiment of the abutment 52 and the biasing member 56. In this embodiment, the biasing member 56 is in the form of a resilient pad of elastic material and the abutment member 52 is in the form of a disc-shaped member.

Figure 15 shows the arrangement generally described with reference to Figures 12 and 13 in which the biasing member 56 is a spring. In the embodiment of Figure 16, the biasing member 56 is in the form of a leaf spring so that the movement characteristics of the abutment member 52 are along an arcuate line as shown by arrow E in Figure 16 rather than straight up and down as would be the case of

the bias provided by the resilient elastic pad of Figure 14 and the coil spring of Figure 15. Movement of the abutment portion may also include some side to side movement as well as up and down movement or movement along an arcuate line.

Figure 17 shows a different embodiment of the abutment member 52. In this embodiment, the abutment member 52 is an inflatable chamber 52′ which has an inlet valve 60 so that pressurised fluid can be supplied to the chamber 52′ to inflate the chamber 52′. Thus, the chamber 52′ can be inflated to adjust the upper surface 52a of the chamber 52′ relative to the remaining seat portion 54 and in this embodiment the air pressure within the chamber 52′ provides the biasing means for biasing the abutment member 52.

Figure 18 shows a similar arrangement to Figure 17 except that the nature of the inlet valve 60 is different. In Figure 18 the inlet valve 60 is a French valve.

Figures 19 and 20 show yet a further embodiment of the invention in which the abutment member 52 is also an inflatable chamber but in this embodiment, the abutment member 52 is ramp or wedge shaped having an inclined surface portion 59 side surface portions 61 and a rear surface 63. The rear surface 63 is formed in concertina type fashion so that as the wedge shaped chamber 52 is expanded, the concertina section 63 can concertina outwardly to accommodate expansion of the chamber 52 and to facilitate maintaining the chamber 52 generally in the wedge shape as shown in Figures 19 and 20. As in the embodiments of Figures 17 and 18, an inlet valve 64 is provided for the application of pressurised fluid.

Figure 19 shows the chamber 52 partially expanded and Figure 20 shows a chamber fully expanded.

Once again, by inflating the chambers 52, the inclined surface 52a of the chambers 52 will be biased outwardly relative to the seat portion 54 by the fluid pressure in the chambers 52 and as the rider pedals on the bicycle seat, the inclined surface 52 can provide support to assist location of the rider into a semi-standing position so that more power can be delivered as is more fully described in my international application PCT/AU94/00284. However, in this embodiment, the surface 52a can basically float by virtue of the bias provided by the air pressure as the rider pedals so that the portion 52a will move during pedalling motion to maintain support and comfort for the rider.

Figure 21 shows the seat according to Figures 9 to 18 in which floating abutment portions 52 are included and in this embodiment of the invention an outer cover 69 is provided on the seat. The outer cover 69 could be formed from leather, cloth, PVC, webbing material or plastics material and would generally not interfere with the movement of the abutment portion(s) 52. The cover 69 merely prevents any likelihood of a user being pinched between the abutment portion 52 and the remainder of the seat 54 during movement of the abutment portion 52 relative to the remainder 54 of the seat.

Figure 22 shows a further embodiment of a seat 70 which is contoured generally in the same manner as the seat described with reference to Figure 4. However, in this embodiment, the seat contains two chamber sections 72 which can each be independently inflated by inlet valve 74 which communicate with the chamber 72 and project out of the bottom of the seat 70. Each of the chambers 72 can be inflated to a particular pressure to suit riding comfort and anatomy support during pedalling motion so that the portion 72 can move under the pressure applied during its

pedalling motion by a user.

Figures 24 to 31 show seats similar to the embodiments of Figures 17 and 18 in which abutment portions 52 are provided which are inflatable chambers and which cause the upper surface of the chamber 52 to move relative to the remainder 54 of the seat as the abutment portion 52 is inflated. The shape of the abutment portion 52 can be generally disc-shaped as previously described and any number of such abutment portion 52 can be provided. The abutment portions 52 can be provided at different parts or places on the seat as is shown by Figures 24 to 27.

Figure 28 shows an embodiment in which the chambers 52 are ramp shaped as described with reference to Figures 19 and 20.

Figure 29 shows a seat which has both ramp shaped and disc shaped abutment portions 52.

Figure 30 shows an embodiment in which the abutment portion 52 is shaped generally as per the shape described with reference to Figure 1 or Figure 4 and Figure 31 shows the similar shaped abutment portion 52 but on a slightly different position on the seat.

The inflatable abutment portions 52, which are generally formed by chambers as previously described, have a conduit 75 connected therewith so that pressurised fluid can be provided to the abutment portions 52 to inflate them to a required inflation pressure.

Figure 32 is a side view of the seats of Figures 24 to 31 and Figure 33 is a view similar to Figure 32 but with a cover 77 over the seat which function in the same manner as described with reference to Figure 21.

Figure 34 shows the abutment portion 52 which is in the form of a housing which has the same shape as the housing described with reference to Figure 4. An inlet tube 80' is formed on the abutment portion 52 forming a pressurised fluid inlet to the abutment portion 52. The conduit 75 may be connected to the inlet 80' as shown in Figures 35 or 36 by either locating an O-ring 82 about the inlet 80' and conduit 75 so as to seal the conduit 75 to the inlet 80' as shown in Figure 35 or by making the conduit 75 integral with the inlet 80' as shown in Figure 36.

As is shown in Figure 37, the end of the conduit 75 remote from the abutment portion 52 is provided with a connector 80. The connector 80 can be coupled to conduit 75 by an O-ring 85. The connector 80 includes a screw-threaded opening 82 and a tap valve 84. The conduit 75, when the bicycle seat is located on a bicycle, preferably leads from the seat to the handle bars of the bicycle and the connector 80 may be secured to the handle bars at a suitable location by a bracket, clamp or the like.

A carbon dioxide cartridge 90 or like supply of pressurised gas is adapted to be fitted to the connector 80 by screw threading the cartridge 90 into the recess 82 so that the cartridge 90 locates on the connector 80 as shown in Figure 39. As the cartridge 90 is screw-threaded all the way into the recess 82, a projecting button 86 in the recess 82 will contact a valve member (not shown) in the cartridge 90 to open the cartridge 90 to enable compressed carbon dioxide in the cartridge 90 to flow from the cartridge 90, through the connector 80 into conduit 75 and therefore into the abutment portion 52 to inflate the abutment portion 52.

The tap 84 may be closed after the abutment member 52 is fully inflated so as to prevent escape of pressurised fluid and also to maintain the remainder of the pressurised fluid

within the cartridge 90. The tap 84 therefore basically provides a locking control for locking the abutment 52 in the fully inflated position after the abutment portion 52 has been fully inflated.

In alternative embodiments, it would be possible to shut off flow of compressed gas from the cartridge 90 to the conduit 75 by simply partially unscrewing the cartridge 90 so that the valve (not shown) in the cartridge 90 shuts off. In this embodiment, it will be necessary to include a one-way valve in the conduit 75 or connector 80 so as to prevent escape of pressurised fluid out of the abutment portion 52.

Thus, in order to place the abutment portion 52 in an active or support position outwardly of the remainder 54 of the seat, the cartridge 90 is screwed into the connector 80 and the tap 84 open so as to inflate the abutment portion 52. The tap 84 can be closed to basically lock the abutment portion 52 in the inflated position. If the abutment portion 52 deflates, additional compressed gas can be supplied by simply opening the tap 84 so additional gas is supplied from the cartridge 90 to the above portion 52.

The abutment portion 52 or conduit can be provided with a release valve 92 to release the pressure in the abutment portion 52 should that be necessary or should the abutment portion 52 be over inflated for a rider's requirement. Thus, by depressing the release valve 52, air pressure in the abutment portion 52 can be released out of the valve 92. Alternatively, the tap 84 could be a 2-way tap for venting gas in the abutment portion 52 to atmosphere if desired.

This embodiment therefore provides a seat in which the abutment portion 52 can be adjusted relative to the

remainder 54 of the seat by inflating the seat and the inflated abutment portion 52 will provide support during riding and also comfort to the rider during pedalling motion. The abutment portion 52 can be shaped to place the rider into a high performance position as described in my international application PCT/AU94/00284 or otherwise shaped to provide support and comfort to the rider during pedalling motion depending on the rider's requirements during pedalling motion.

Since modifications within the spirit and scope of the invention may readily be effected by persons skilled within the art, it is to be understood that this invention is not limited to the particular embodiments described by way of example hereinabove.

Dated this 9th day of December 1996

Paul Damian NELSON
By his Patent Attorneys:

GRIFFITH HACK
Fellows Institute of Patent
Attorneys of Australia.

FIG. 1

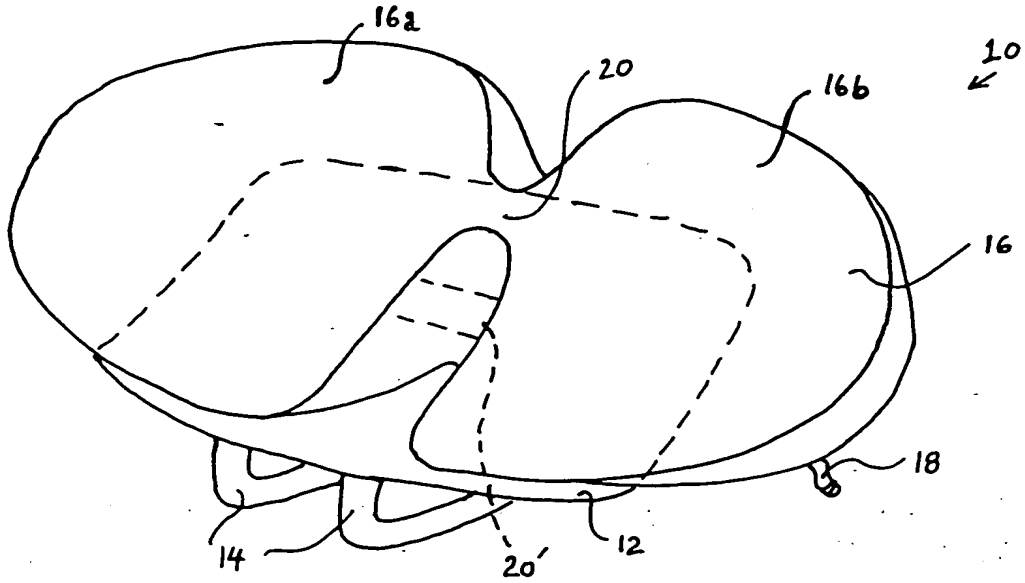


FIG. 2.

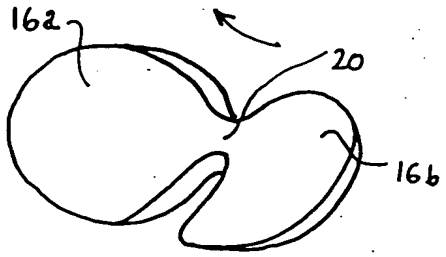


FIG. 3

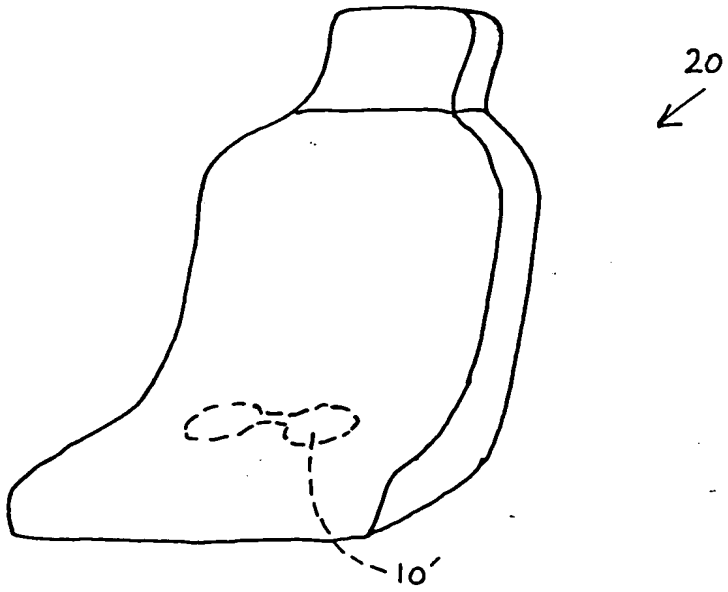


FIG. 4

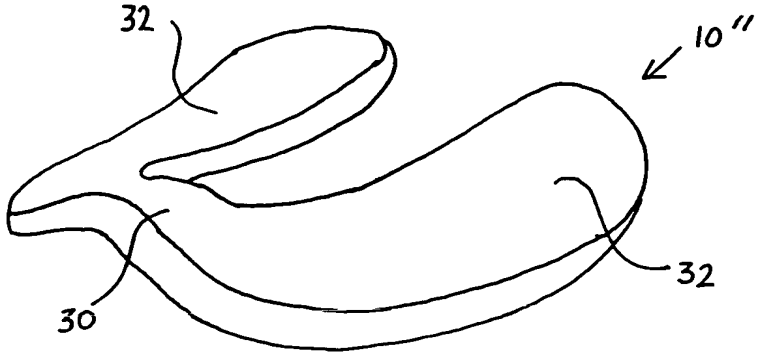


FIG. 5

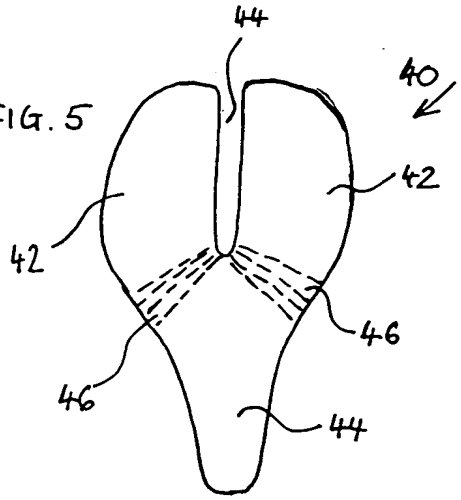


FIG. 6

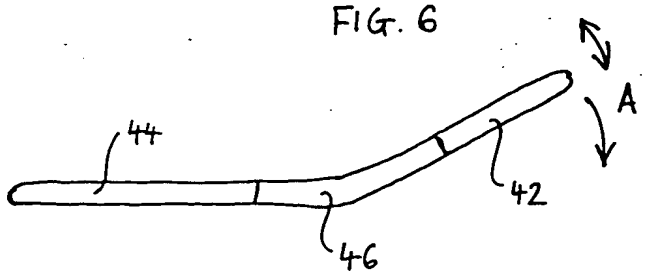


FIG. 7

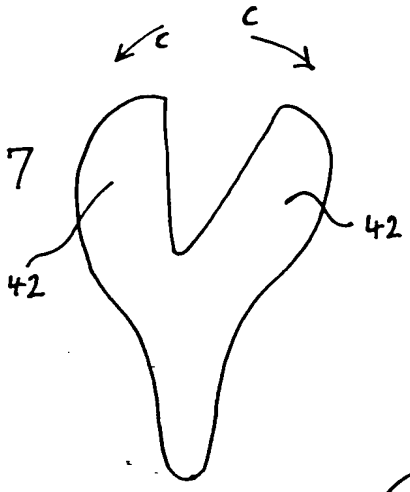
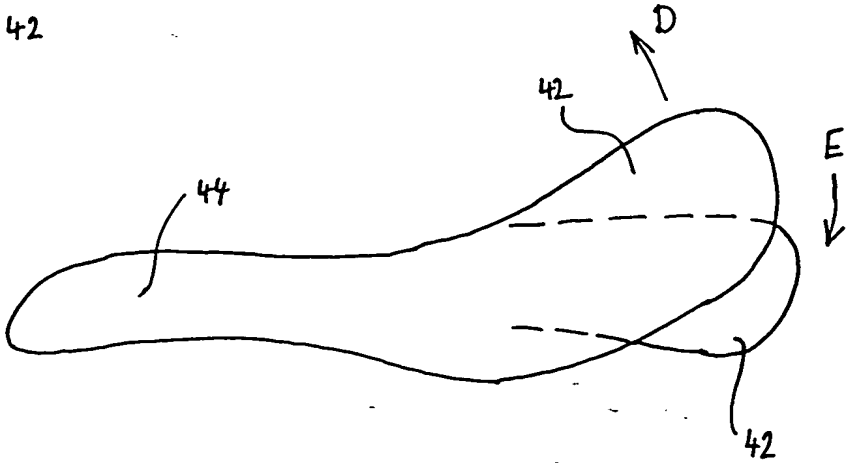


FIG. 8



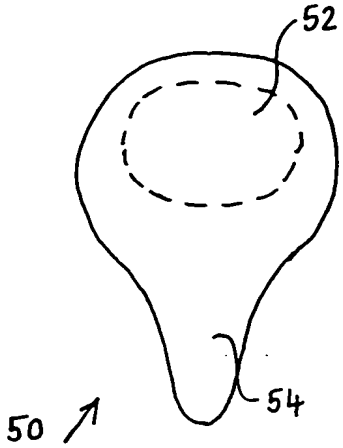


FIG. 9

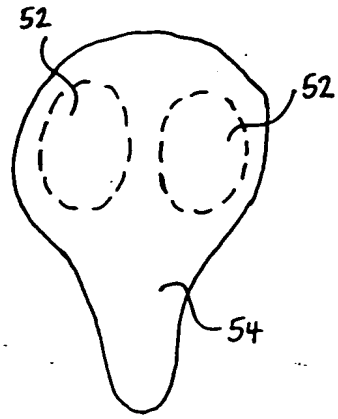


FIG. 10

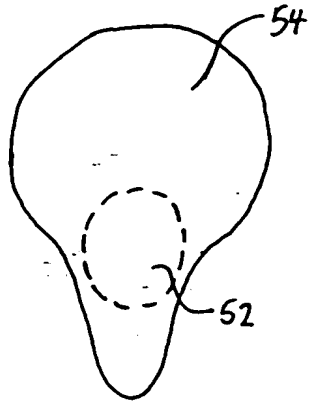
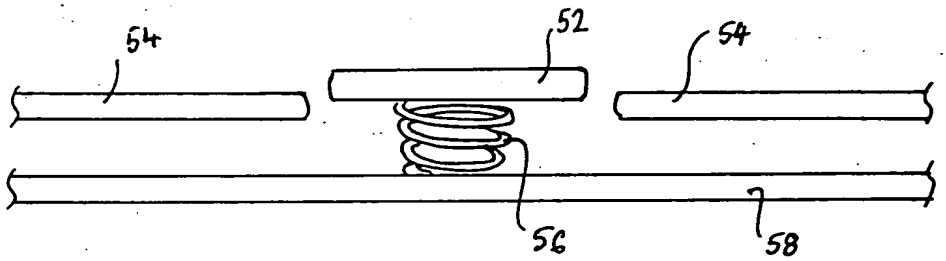


FIG. 11



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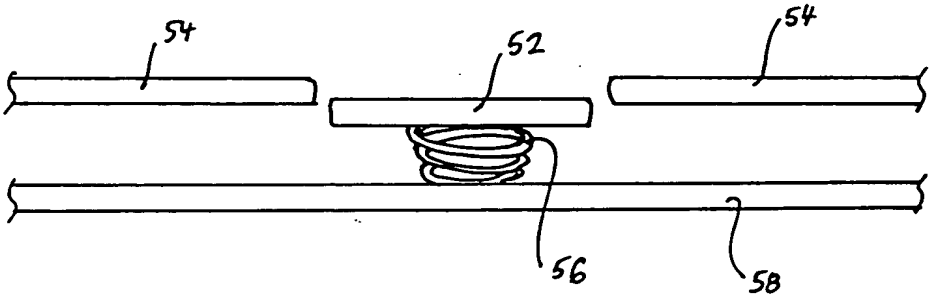
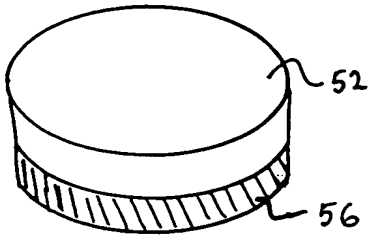


FIG. 13

FIG. 14



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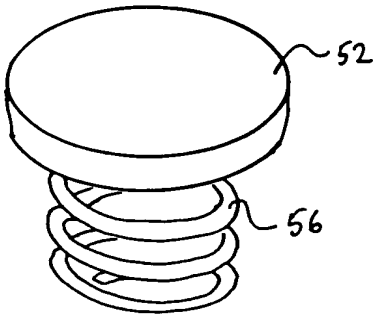

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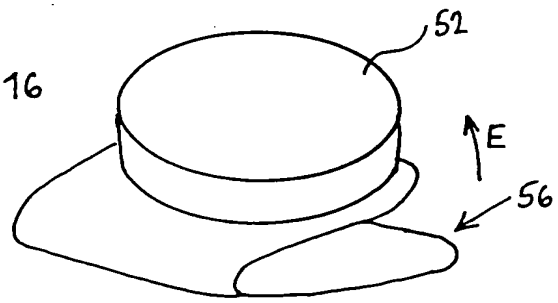


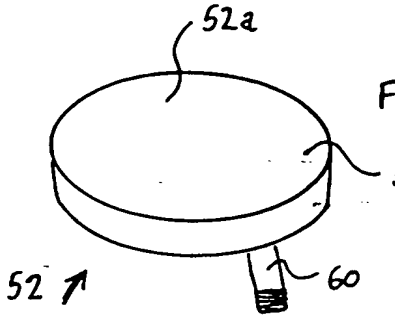


FIG. 17

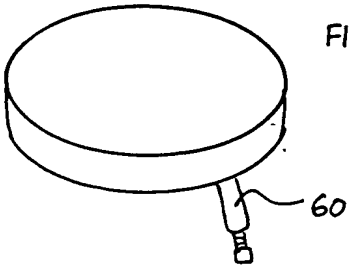


FIG. 18

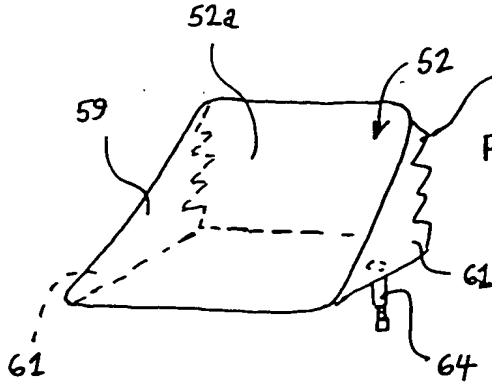


FIG. 19

FIG. 20

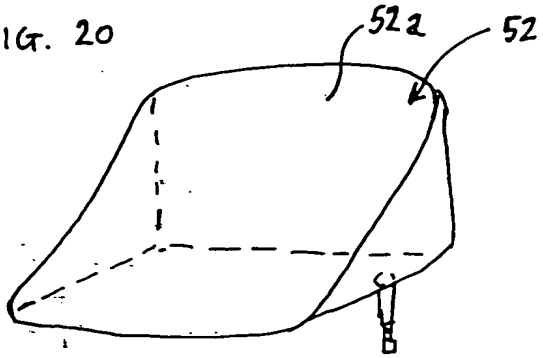


FIG. 21

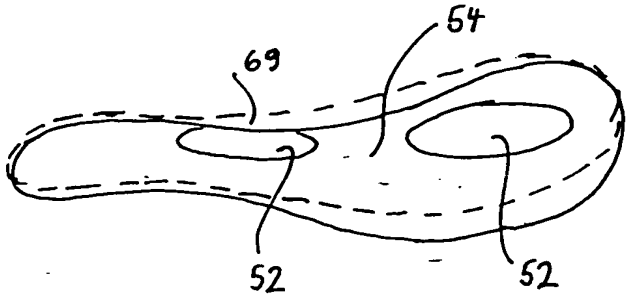


FIG. 22

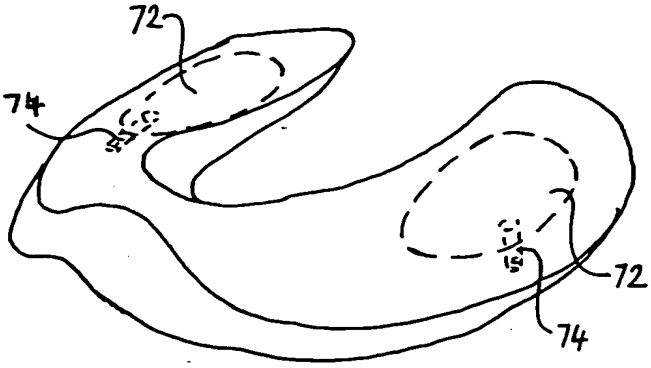


FIG. 23

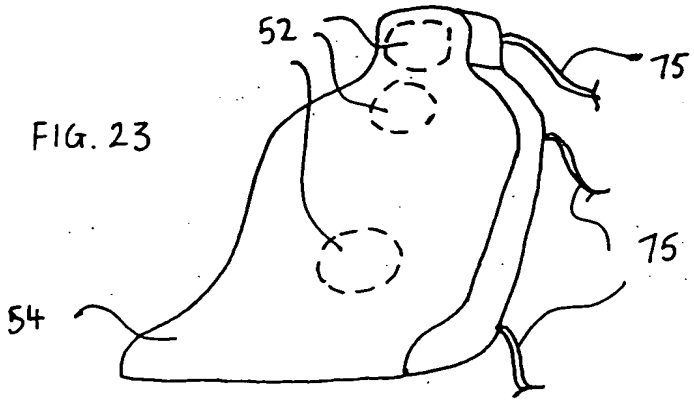


FIG 24

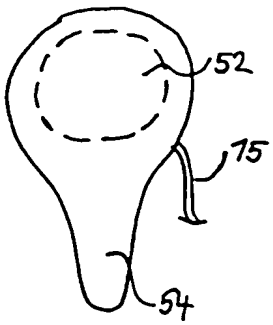


FIG 25

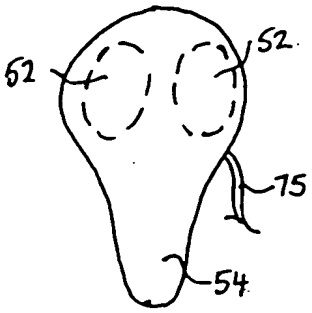


FIG. 26

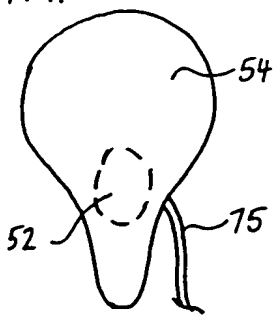
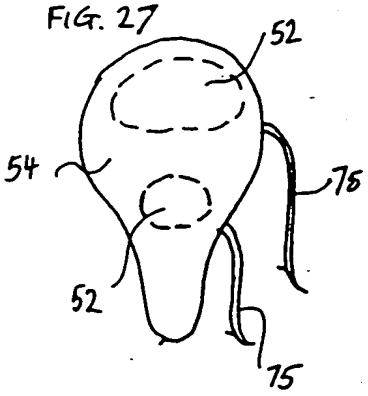


FIG. 27



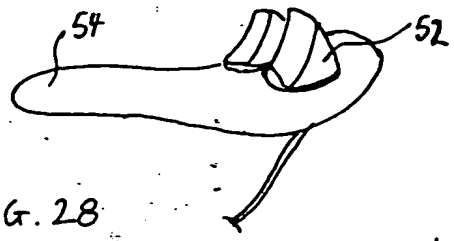


FIG. 28

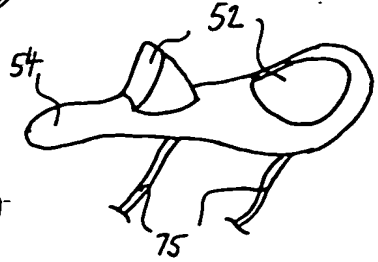


FIG. 29

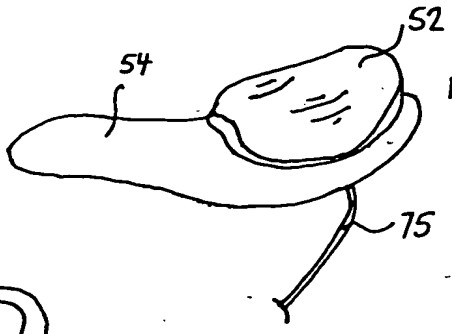


FIG 30

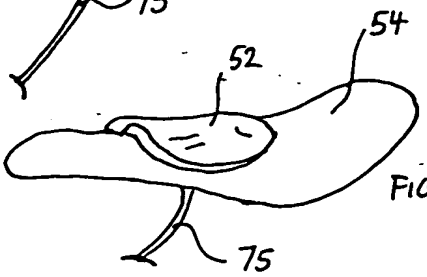


FIG. 31

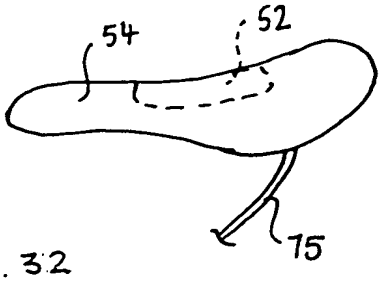


FIG. 32

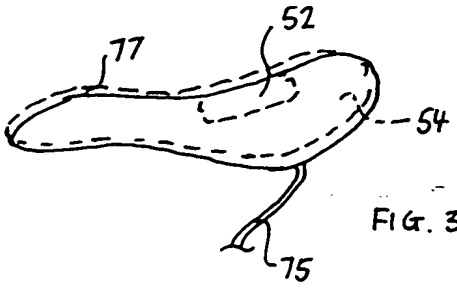


FIG. 33

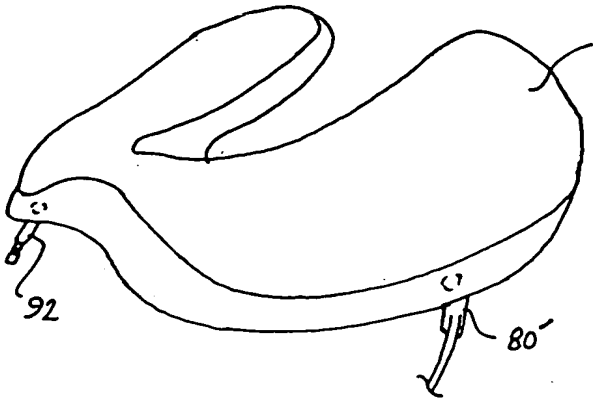


FIG. 34

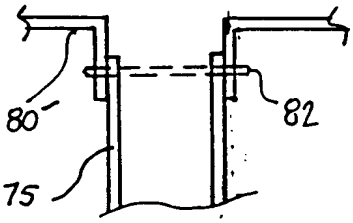


FIG. 35

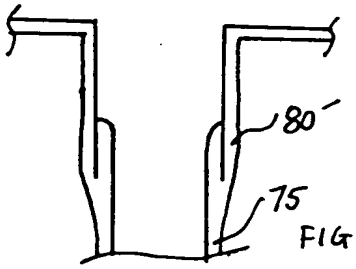


FIG. 36

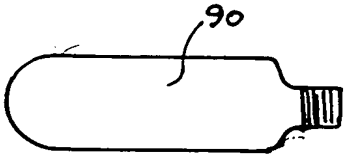
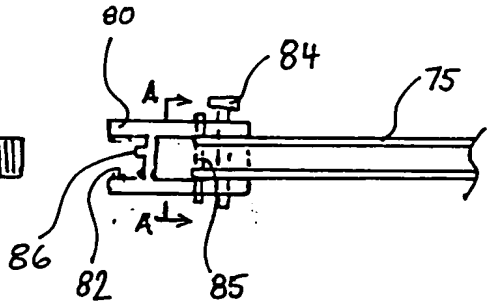


FIG. 37



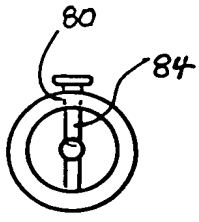


FIG. 38

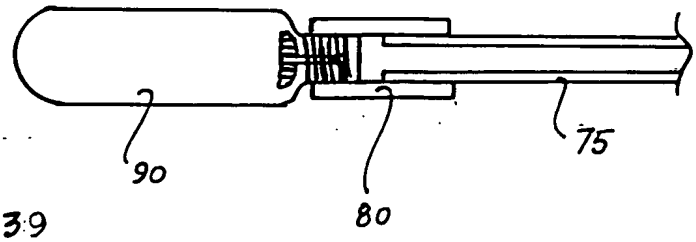


FIG. 39

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